being sought is important to the CAP's ability to compete.[69] Moreover, where the interconnection offering is asset specific, as most are at present,[70] transaction cost economics teaches that the LEC's strategic predilections are reenforced by rational economic behavior.

Recognition of the influence of bounded rationality and opportunism reenforces the need for targeted regulatory intervention. This is particularly true where there is a wide disparity in the information available to the seller and the buyer, and there is a high degree of asset specificity.[71]

In the context of local access and interconnection, dozens of examples of the need for regulatory intervention occur each week. Some of the more prominent and intractable (without active intervention) occur in the "soft assets" side of interconnection, involving access to and use of databases, signalling systems and protocols and operating systems. Access to these soft assets is critical to equality of access by CAPs to the customer and hence to effective competition. Soft assets by their nature are more

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[69] *See* Monograph at note 74 ("Information asymmetry is a basic hazard to any regulatory scheme that is heavily dependent on data provided by a regulated firm.")

[70] *See* discussion at page 8, *infra*. Although when first developed, access and interconnection assets may appear to be asset specific, there is no technical or economic reason that most access offerings need to remain asset specific. The experiences with the passive interconnect devices in the terminal equipment field (devices that proved to be unnecessary despite the telephone industry's plaints) and interconnection in the IXC arena demonstrate this even though those are easier and less complex cases.

[71] *See, e.g.,* Monograph at 14, pt. 4, and 31, esp. n. 87.

difficult to define and more difficult for the purchaser or user to determine features and functions in order to make a rational buy decision.

One recent recurring example is the CAP industry's efforts to have the Carrier Identification Code ("CIC") passed to them by the LECs so that they can provide services to multiple carriers over common facilities. Despite the fact that the CIC is passed to CAPs during international calls, many LECs have been insisting that entirely new signalling protocols, the Carrier Identification Parameters, be established through the laborious processes of an industry-standards forum, dominated by the LECs. The difficulty for an outsider in understanding the nature and attributes of the CIC, and the systems processing, has greatly handicapped the CAPs' efforts to obtain access to the CIC and left them largely at the mercy of the LECs. This is but one example of why the factors identified by transaction cost analysis argue for direct regulatory intervention, as outlined below in Subsections E, F and G.

The degree to which competitive markets are able to effectuate transactions is influenced not only by the degree of specialization of an asset and by the uncertainty created by differences in the level of information available to each party to the transaction, but also by the frequency of transactions. Setting aside for the moment the effect of asset specificity, as a general proposition, the more frequent the transactions involving a given type of asset, the greater the certainty that the seller will be able to recoup its investment, and the more likely that the transactions will be completed.[72] This principle suggests, in the context of local exchange access, that an active competitive market is more likely where there are buyers able to afford frequent purchases of access services.

Transaction cost economics holds that the principles of asset specificity, uncertainty and frequency interact to determine the behavior of the trading parties and the outcome of the transaction. As stated earlier, setting aside the influence of strategic behavior, greater degrees of asset specificity and of uncertainty tend to drive the seller to seek vertical integration. The impulse is to derive value from the asset by using it internally, rather than negotiating exhaustively-detailed contracts in which the seller attempts to anticipate every unknown contingency that might occur after the transaction is completed.

Admittedly, the increased costs of vertical integration, and the countervailing prospect of benefitting from economies of scale and scope if the asset is sold on the open market, can induce the seller to transact in the marketplace rather than "in-house." On the other hand, economies of density, arising from frequent sales, counter the adverse effects of the cost of internal sales, restraining the impulse to vertically integrate.

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[72] *See* Oliver E. Williamson, *The Economic Institutions of Capitalism* at 60 (New York: The Free Press 1985)("The cost of specialized governance structures will be easier to recover for large transactions of a recurring kind").

The cost of vertical integration is further reduced, and its attraction increased, by the ability of the dominant player to cross-subsidize its costs. Cross-subsidization is, as the Commission has recognized, greatly facilitated if the transactions are internal.[73]

The interplay of the foregoing factors, in conjunction with their natural incentive to engage in strategic behavior, impels the LECs to favor vertical integration, where it is permitted by regulation. Where vertical integration is not legally possible, transaction cost economics demonstrates that, at the present stage of the entry of competitors in the local exchange market, the LECs are impelled to champion access and interconnection offerings that are designed to seriously disadvantage their competitors, or at least have that effect.

Because their competitors have no other present alternatives and must purchase from the LECs in order to compete, the LECs have the incentive to make their access offerings asset specific (by, for instance, bundling discrete elements that would otherwise be non-specific) and still sell them in the marketplace. The dependency of the CAPs and other potential competitors upon access to the local exchange means that they will be compelled to purchase from the LECs at prices and terms

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[73] See, e.g., *Regulatory and Policy Problems Presented By the Interdependence of Computer and Communications Services and Facilities*, 28 FCC 2d 267, 272-274; *Second Computer Inquiry*, Docket No. 20828, 84 FCC 2d 50, 77 (1980); *Separation of Costs of Regulated Telephone Service from Costs of Nonregulated Activities*, 62 RR 2d 163 (1987), *recon. granted*, 64 RR 2d 47 (1987).

that allow the LECs to reap monopoly rents and cover the cost of their sunk investment despite the specialization of their assets.

Transaction cost analysis thus predicts the very type of behavior that has in fact occurred -- the vigorous LEC resistance to special and switched transport access. LECs have utilized every tool at their disposal to successfully delay implementation of expanded interconnection for special access and switched transport.[74] The LECs' tariffs included inflated overhead loading factors, overstated direct investment, double counting, and rampant discrimination. The pernicious effects of the LECs' willingness to manipulate information solely in their possession are aggravated by the price reductions permitted by zone density pricing and term and volume discounts. Transaction cost analysis suggests that a firm in the LECs' position will act strategically. The LECs' efforts to delay expanded interconnection while initiating flexible pricing plans do not disappoint.

E. Transaction Analysis Demonstrates that the Solution to the LECs Anti-competitive Access Offerings is to Require Them to be Non-Specific and Generic.

Transaction cost analysis not only predicts that the LECs will behave anti-competitively, it also suggests the ultimate solution. *Access must be made as non-specific as is economically efficient.*[75] In most cases, this means that access should be

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[74] *See*, *supra*, at 15, note 22 and accompanying text.

[75] There may well be a few situations, particularly in the early days of competitive entry into the local exchange, where it would make economic sense to a CAP to purchase a special purpose

unbundled to its smallest discrete elements. Unbundling should reduce the LECs' incentive to unreasonably price and to discriminate among access purchasers in order to protect their investment. (The more generic the asset, the less either the ability or the need to engage in strategic behavior.) Unbundling also should, over time, facilitate the emergence of multiple suppliers of access and, thereby, lessen the dependence of the CAPs upon a particular type of access from a particular provider. This development should undermine the ability of the LECs to raise entry barriers.

Access transactions must also be made as certain as possible, by ensuring that the CAPs have as much information about the cost and features of each type of access as the LECs have. *Making access transactions open, visible and equally understandable to all parties* would have a three-fold benefit. First, it would thwart the LECs' ability to exploit uncertainty in the pricing and conditions of access. Second, it would make it more difficult for the LECs to justify imposing onerous contractual conditions and discriminating in the terms and conditions for similar types of access between commercial customers and competitors. Third, it would reduce any hesitancy on the part of the LECs to provide access because of doubt as to their ability to recoup adequate returns.

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asset for access or interconnection even if it had to endure the cost and burden of a long-term contract with detailed "safeguards" for the LEC. The CAP industry and other access purchasers can, however, only make this type of a decision if all of the aspects (and economic costs) of the transaction are open and visible.

Access transactions should be encouraged to occur on an increasingly frequent basis. In other words, regulators should seek a market structure that is conducive to multiple purchases of each type of access service. When combined with a reduction in the specificity of access offerings and an increase in public information concerning them, an increase in the number of access transactions will reduce the cost of each transaction and thereby foster a competitive market exchange.[76]

In summary, reducing reliance upon special purpose technology for access, enhancing the information concerning access cost and functionality and increasing the number of access purchases are necessary prerequisites to a competitive local exchange market. The more homogeneous and visible the provision of access, the less the opportunity or incentive for strategic behavior by the LECs and the easier for the Commission to police such behavior if it does occur. And the more homogenous and visible the provision of access, the greater the number of potential competitors that can afford it, and the greater the number of entrants.

F. Detailed Definitions of Access Services are the Critical First Step.

The seminal issue then becomes what is the best process for achieving the goals of affordable and obtainable access to LEC networks. Once again, transaction cost analysis suggests the

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[76] Frequent transactions are of particular benefit where access assets are or continue to remain specialized. *See* Williamson at 60 ("The cost of specialized governance structures will be easier to recover for large transactions of a recurring kind.")

answer.

The starting point for any analysis must be a definition of the bundle of rights that comprise local exchange access in each of its forms. Until these attributes are described in readily understandable form, it is impossible for the Commission to analyze the interplay of the factors summarized above. Hence, it is impossible for the Commission to determine the effect of transactions in access upon the market or its participants. In the absence of detailed definitions, it is likewise impossible to determine whether the local access market is competitive or, if not, predict when it could become competitive. Much less would it be possible to devise appropriate rules for the transition to competition, as the NPRM requests.

G. The Commission Should Convene the Industry Participants in Negotiations Under the Auspices of the Commission Staff.

The second issue then becomes what is the best method of defining the panoply of access rights. The Commission's experience the last time it addressed the subject of how to fathom the best and fairest means of providing competitors access is instructive. When MCI and other nascent competitors to AT&T (then integrated with the Bell Operating Companies) sought interconnection and access rights, the Commission eschewed the paper proceeding route, with its attendant requirement that the Commission act as the decision-maker. Not only were paper proceedings deemed to be resource-intensive, past experiences indicated that they were unlikely to be efficient or productive.

The Commission chose instead to convene a series of intensive negotiations -- the so-called ENFIA negotiations -- among the principal industry players chaired by the Common Carrier Bureau staff. The staff made it clear to the industry participants that, if the negotiations did not bear fruit, it would act to impose its own judgments. The negotiations did in fact result in an agreement that the Commission subsequently adopted.[77]

ALTS strongly believes that the ENFIA negotiations are the model that the Commission should follow in establishing the types, conditions and terms, including prices, for local access. The factual predicates and issues are simply too technical and too complicated to admit of easy answers. Rather than require the Commission staff to sit as arbitrator based upon a paper proceeding, ALTS believes that the end result would be reached much more quickly and the end product much more acceptable to the industry as a whole, with substantially less consumption of

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[77] The negotiations that resulted in the first comprehensive set of interconnections to the national telephone network to enable AT&T's competitors to compete in the provision of switched services are commonly referred to as the ENFIA negotiations. AT&T had reacted to the judicial mandate that it furnish interconnection for "Execunet"-type services by filing a tariff for Exchange Network Facilities for Interstate Access. In the words of a later Chief of the Common Carrier Bureau, the "tariff provided for drastically higher rates for local exchange lines provided to other companies to be connected to an Execunet type service than for local exchange lines provided for ordinary business purposes . . .." Gerald W. Brock, "The Telecommunications Industry: The Dynamics of Market Structure" at 227-28 (Harvard 1981). The new entrants into the market objected strenuously. The Commission convened a series of intense negotiations among AT&T, GTE, three interexchange carriers and three trade associations. The negotiations lasted three months, culminating in a compromise that the Commission largely accepted. *See id.* and *Exchange Network Facilities,* 71 FCC 2d 440 (1979), subsequent history omitted.

Commission resources, if the ENFIA model were to be adopted. ALTS and its members are eager to participate in such a process, which should be commenced at the earliest possible time.

It is important for the Commission to recognize that active Commission intervention at this early stage does not presage deep Commission involvement in perpetuity or even for an extended period of time. Indeed, the opposite is true. An investment of Commission resources now, to ensure that the definition task is accomplished expeditiously and completely, should save thousands of person hours later.[78]

IV. **CONCLUSION**

If the Commission does not move now to facilitate private negotiations to define access rights across-the-board, it will continue to be faced with the daunting task of adjudicating endless disputes based upon incomplete and constantly stale records. This does not mean that the Commission will be able to remain a completely passive player in the decade of transition to a more competitive local exchange market. Disputes will continue to exist requiring active intervention, particularly where access services remain bundled in the interim.[79] But the sooner that the rights are defined by the parties that know them best, the less the need for Commission intervention.

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[78] *See* note 6, *supra,* and Duvall/Williams Monograph at 32, n. 86 and 87. One of the central points here is encapsulated in footnote 87 in the Monograph, which depicts "a dramatic effect on market conduct and performance" that might result from a Commission-inspired definition of rights in the local access arena.

[79] *See id* at 43-44, pts. 9 and 10.

Now is the time for the Commission to seize the initiative, based upon the new insights gained from transaction cost economics. The Commission has an opportunity to make a major difference in the way that the local exchange market is structured and to facilitate the development of competition at an affordable cost and pace.

ALTS urges the Commission to convene an ENFIA-style negotiating proceeding among all interested participants in the local exchange market as soon as possible under the threat of an early Commission prescription if the participants fail to reach a reasonable compromise.

Respectfully submitted,

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May 9, 1994

EXHIBIT A

Telecommunications Consulting Group, Inc.

Guidelines for Designing Federal Regulatory Policy to Promote Competitive Local Telecommunications Services

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Prepared for
Association for
Local Telecommunications Services
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May 1994

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Contents

Summary

This study is motivated by the observation that the emergence of competition for local telecommunications services raises new regulatory and public-policy concerns. While regulators may gain many valuable insights from the experience with the development of competition in the terminal equipment and interexchange service markets, local competition may pose problems that are significantly different from those previously faced.

Section 1 of this paper outlines the fundamental difference in local competition. In both the terminal equipment and interexchange cases, the physical interfaces that form the boundaries between competitive offerings and the non-competitive local exchange carriers (LECs) are relatively fixed and straightforward. For local competition these boundaries are not yet defined, but there is some evidence that they may never be as simple as has been the case for other competitive telecommunications markets.

Because of this fundamental difference, Section 2 proposes a new paradigm for formulating regulatory policy for competitive local telecommunications services. The paradigm is adapted from the emerging literature on the New Institutional Economics, especially the aspects of the literature addressing the economic implications of property rights and transaction cost economics. This paradigm identifies those aspects of the economic reorganization of the local telecommunications service industry resulting from the entry of rivals competing with incumbent LECs that may prove hazardous to the development of competition.

The discussion in Section 2 explains the pivotal role of the establishment of property rights in the development of competition in both the U.S. domestic terminal equipment and interexchange telecommunications markets. The public utility concept is taken as an example of how society may attenuate certain property rights to achieve public policy goals. Additionally, society may subsequently nullify certain property rights to achieve different public policy objectives, such as the introduction of competition in public utility markets where competition previously was prohibited.

Once property rights are established, voluntary exchange among trading partners is possible. Such voluntary exchange may lead to the emergence of competitive markets. Such exchange may also occur as a transaction within a firm. Thus, markets and the internal organization of firms, or *hierarchy*, represent alternative *governance structures* for completing transactions. From the perspective of transaction cost

economics, the choice of markets or hierarchy hinges on which governance structure minimizes the cost of completing the transaction.

Transaction cost depends on certain attributes of a specific transaction, namely: *asset specificity*, *uncertainty*, and the *frequency* of the transactions. In general, asset specificity is the most important attribute influencing the relative efficiency of market versus hierarchy as alternative governance structures. Asset specificity refers to the extent of specialization embedded in a physical asset or the human capital of employees. Transaction cost economics explains why transactions involving the services of highly specialized or idiosyncratic assets may be exceedingly difficult to achieve using the market mechanism. Vertical integration is a possible consequence of the difficulties of effectuating transactions using markets in cases where asset specificity is extensive.

Given the context of transaction cost economics, two potential problems that may adversely affect the development of competition in local telecommunications markets are examined, namely: (1) dominant firm strategic behavior; and (2) inefficient industry structure. Each issue illustrates how voluntary market exchange between LECs and their competitors may be impeded by *transactional barriers* inherent in the type of transaction; by LEC strategic behavior; or some combination of both. The analysis points toward a role for federal regulation during the emergence of competition that emphasizes attention on possible transactional difficulties between LECs and their competitors. Moreover, the analysis suggests the possible advantages of greater reliance on negotiations between LECs and their rivals to reach agreements on price and terms and conditions of services, facilities, or functionality provided by LECs to their competitors.

Given the time required to establish property rights and to resolve transactional difficulties between incumbent telecommunications firms and entrants, the development of competition in the telecommunications industry involves three distinct phases, namely: (1) contested industry reorganization; (2) market expansion and growth; and (3) market maturity. The role of federal regulation differs in each phase. At present, competition in local telecommunications services markets falls within the first phase. In this phase of competitive evolution, price cap regulation of LECs provides one component of a regulatory strategy that addresses some of the impediments to voluntary exchange between LECs and their rivals that might otherwise threaten the transition to competitive local telecommunications markets.

The regulatory and public-policy concerns discussed above are much more troublesome to the extent that the LECs continue to produce services and possess facilities that are unique. Otherwise, competitors to the LECs would have no reason to depend upon the LECs for facilities and services to be used in the creation of competitive offerings. If, as some contend, full competition with the LECs is imminent, then regulation may be relaxed more rapidly than would otherwise be the case.

Section 3 surveys in concrete terms the diverse array of emerging technologies that might permit substitution for the local telecommunications services offered by the LECs. In particular, cable television networks are examined as a substitute for LEC local networks, and radio-based networks are examined as a substitute for all landline-based local networks. The evaluation indicates that each of these major types of networks may be superior for certain classes of traffic. Hence, substitution of these other technologies for LEC networks and facilities may be less likely than some would believe.

The analysis in Section 3 suggests that a very complex industry structure may evolve in local telecommunications markets. The possible diversity of local technologies and services, some of which may be interdependent, underscores the critical importance of understanding the underlying factors that will influence transaction costs—especially asset specificity—in future exchange relationships between the LECs and their rivals. Absent such an understanding, and appropriate regulatory policy and processes, an inefficient industry structure may emerge as a consequence of unaddressed transactional barriers.

A number of specific conclusions are reached in various sections of this paper. In general, these specific conclusions support in one or more ways the following broad conclusions:

1. Application of economic concepts developed within the literature of the New Institutional Economics, specifically the economics of property rights and transaction cost economics, complements the structure-conduct-performance paradigm as a method for assessing the extent of competition by explaining how transactional barriers may affect voluntary market exchange.

2. The definition of new property rights through federal regulatory proceedings and subsequent judicial review is essential to the development of competition in U.S. domestic telecommunications markets.

3. Transaction cost economics suggests that certain attributes of a transaction between trading parties will affect the efficacy of market exchange, resulting in the integration of firms if transactional barriers are sufficiently high. Asset specificity is the key attribute of a transaction that will affect the efficacy of market exchange, although both uncertainty and transaction frequency play important roles.

4. Viewed from the perspective of transaction cost economics, strategic behavior by LECs may impede market exchange with rivals. There exist circumstances, however, where impediments to market exchange between LECs and their rivals may be attributable to unique attributes of the transaction and not LEC strategic behavior.

5. The transaction cost analysis of market exchange in local telecommunications services markets points towards the need for a special emphasis on federal regulation during the early phases of the development of competition. This emphasis includes a careful review of the responses of LECs to requests by rivals for interconnection, facilities and other services, in order to determine to what extent transactional barriers will impede market transactions. From a transaction cost perspective, regulatory processes may reduce transaction cost by offsetting transactional barriers that impede the development of competition in the emerging markets for local telecommunications services.

6. Broadly speaking, competition in local telecommunications service markets is in a phase of contested industry reorganization, where property rights essential for competitive markets remain incompletely defined. Until this phase of the development of competition is complete, price cap regulation of the LECs should continue as currently implemented by the FCC.

1 Introduction

The evolution of the industry structure for competitive local telecommunications services may be a much more complex process than was the case for competition in either customer premises equipment or interexchange services. The FCC's experience with the creation of competitive markets, while very valuable, may be an incomplete guide to future actions concerning local competition. Care should be taken in extending analogies from previous Commission actions in other areas to situations involving the local exchange.

Figure 1 provides a simplified view of the current state of competition in public telecommunications networks in the United States. A striking aspect of this illustration is the relatively simple and stable physical interfaces that form the boundaries between markets that are currently open to competition and markets that are not.[1]

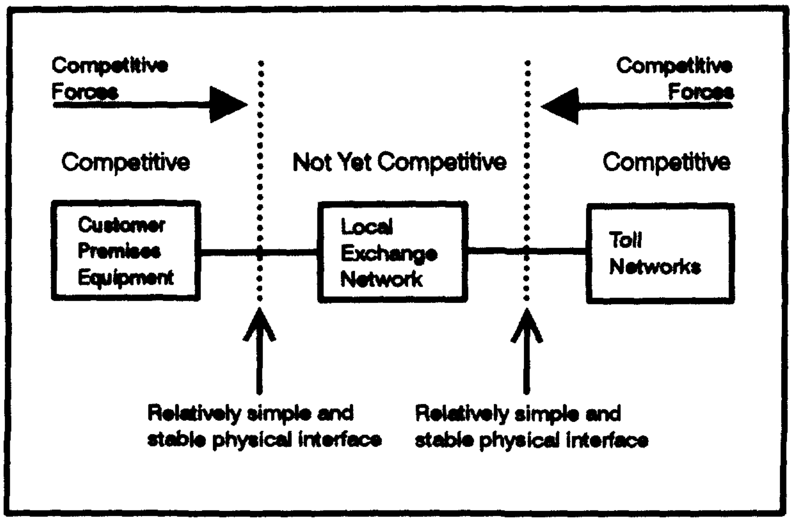

Figure 1—Current State of Competition

Because this illustration is so familiar, and because the boundaries are relatively straightforward, it is easy to forget how much effort was required to establish the industry structure as shown. Establishing the interface between customer premises equipment and the local exchange network required a twenty-eight-year process, beginning with FCC hearings on the Carterfone case in 1956 and ending with the assignment of embedded CPE to AT&T at divestiture in 1984. Establishing the interface between local exchange networks and toll networks took over thirty years, starting with the FCC's *Above 890* Inquiry in 1956 and ending only recently as equal access has neared completion.[2]

[1] Aspects of these interfaces are specified in Commission rules. For example, the technical characteristics of the interface between customer premises equipment and local exchange networks are specified in Part 68 of the rules; the economic relationship between the local exchange and toll networks, in Part 69. These specifications change, of course, as new arrangements and standards are introduced.

[2] For a graphic illustration of this long regulatory history, see Economics and Technology, Inc. and Hatfield Associates, Inc., *The Enduring Local Bottleneck: Monopoly Power and the Local Exchange Carriers* (Boston: Economics and Technology, Inc., 1994), Figure 1.3 and Figure 1.4.

Looking *within* the local-exchange-network box shown in Figure 1, the process of identifying LEC functionality necessary to support competitive services has just recently begun. Rights to most of these functionalities are yet to be established. Further, when the local exchange finally is open to competition, there is no reason to believe that the picture within the local-exchange-network box shown in Figure 1 will be nearly as simple as is the remaining picture outside the box.

An illustration of the complexity of competitors' needs from LEC networks is given in Table 1.[3] The Association for Local Telecommunications Services (ALTS) has prepared this list to describe the complex set of services, facilities and functionalities that competitive local telecommunications service providers require from LECs.

Until some undetermined time in the future, the LECs will retain the majority of the revenue and traffic for many local telecommunications services. Therefore, competitive carriers must be interconnected with the LECs in order to offer ubiquitous services. Such interconnection must be on an equal basis as a co-carrier, in order to place all competitors on a equal footing. Further, certain LEC facilities are absolutely essential for competition to prevail.

Physical interconnection in LEC central offices must be available on technical and economic conditions specified by the interconnector, so long as no harm to the LEC results. Collocation is an example.

Network elements must be available to interconnectors on an unbundled basis and priced the same as they are priced to the network "owner."

Intelligence in the network must be available to all network users on equal terms. Interfaces between programs that route calls must be transparently available to all users on the same basis.

Data bases that provide routing, billing or service information must be available to all service providers on equivalent terms.

Financial arrangements among carriers must be reciprocal and equivalent. When one carrier terminates calls on another carrier's facilities, the charge for terminating must be the same as when the transaction is reversed.

All local exchange service providers must have the opportunity to obtain and assign addresses (telephone numbers) on a fair basis and to allow a user to retain the same address (number) no matter which carrier is serving.

Table 1—ALTS Essentials for Unrestricted Full Interconnection

An example of such essential facilities is the means that produces numbering. For competition to be effective, customers must have a convenient way of switching between a LEC and a competitor; this implies that local numbers must be portable. The technical arrangements that produce local numbering currently are buried deep within LEC networks. Because local numbers must be defined and dispensed by one central authority, such capability inherently must remain a monopoly function. This operation must be removed from LEC networks, both technically and administratively, and placed in an independent entity. Such arrangements, and

[3] Table 1 is taken from Association for Local Telecommunications Services, *Telecommunications Policy 93* (Washington, D.C., 1993):11.

corresponding interfaces between monopoly and competitive services, currently do not exist.

Because the emergence of competition in local telecommunications markets is likely to introduce both difficult and novel issues, this paper proposes a distinctive way for studying and understanding this evolution. Broadly speaking, competition in the U.S. domestic telecommunications industry is viewed as the instrument for "undoing" the previous vertical integration that characterized the industry during much of the twentieth century before the AT&T divestiture in 1984. The introduction of competition in the telecommunications industry during the last thirty years or so is viewed as taking business transactions from within an integrated firm and returning them to the market. Given this prospective on the development of telecommunications competition, several questions emerge:

1. Is this reassignment of business transactions, i.e., the substitution of voluntary market exchange for transactions internal to a firm, sustainable over the longer term? In other words, does this reorganization of the domestic telecommunications industry represent a stable organizational equilibrium or do there exist powerful countervailing forces that will eventually but inevitably force reintegration of the industry?

2. What methodological approach can be used to address this issue?

3. Given an appropriate methodological approach, what should be the public policy role of the Federal Communications Commission (FCC) in terms of such an analysis?

While this paper provides only an initial response to these provocative questions, the type of public policy analysis required for a deeper understanding of these issues is clearly indicated.

Section 2 proposes a methodology for identifying possible impediments to the development of competition in local telecommunications markets. Included in this section is a discussion of alternative approaches for assessing the extent of competition in any given industry, including the structure-conduct-performance paradigm, contestable market theory, and the transaction cost paradigm. Also included in this section is a discussion of the pivotal role of the establishment of certain property rights as a necessary condition in the development of telecommunications competition. Specific impediments to the emergence of competitive local telecommunications markets are then identified and discussed together with the appropriate regulatory response to these problems.

Section 3 examines current and future technologies that may be used to produce local telecommunication services. This examination contrasts LEC local networks with cable television networks and landline networks with radio-based networks. The evaluation suggests that the industry structure for local services is likely to evolve in certain ways; this likely industry structure has implications for the economic analysis presented in this paper.

Finally, Section 4 summarizes the conclusions of this study.

2 A Paradigm for Formulating Regulatory Policy for Competitive Local Telecommunications Services

The emergence of competition in markets for local telecommunications services marks the beginning of an economic reorganization of a segment of the U.S. telecommunications industry long dominated by incumbent LECs. In many ways, the development of competition in markets for local telecommunications services will be more difficult than the development of competition in either the terminal equipment or long distance telecommunications markets. This section of the paper develops a framework for identifying those aspects of the economic reorganization of the local telecommunications services industry that may pose hazards to the realization of public policy goals supporting the emergence of competitive local telecommunications markets.

2.1 Alternative Approaches for Assessing the Extent of Competition

Assessing the extent of competition in real-world markets supplied by complex business firms that serve heterogeneous customers is difficult. Economists usually approach such a complex task by using a conceptual framework that identifies causal factors suggested by economic theory that affect the extent of competition in a particular market or industry. A standard economic framework developed within the modern industrial organization literature that is frequently used to assess the extent of competition is the *structure-conduct-performance* (S/C/P) paradigm.[4] This paradigm establishes a causal linkage between market structure and conduct which taken together determine how well a given market or industry performs.[5] The extent of competition in a given market is evaluated in terms of the presence or absence of specific elements that define market structure and other components of the S/C/P paradigm.

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[4] A standard, industrial organization textbook reference explaining and applying the S/C/P paradigm is F. M. Scherer and David Ross, *Industrial Market Structure and Economic Performance*, 3rd ed. (Boston: Houghton Mifflin, 1990).

[5] The Commission's discussion of Transition Issues 1, 1a, 1c, and 1d in *Notice of Proposed Rulemaking*, CC Docket No. 94-1, adopted January 19, 1994, released February 16, 1994, appears consistent with the way that the S/C/P paradigm might be used to pose the questions asked by the Commission.

Figure 2 summarizes the major components of the S/C/P paradigm. The solid arrows shown in Figure 2 indicate primary directions of causality while the broken arrows show secondary or "feedback" causal relationships. *Basic conditions* include factors, such as the current technology used in the industry and the price elasticity of demand, that influence both supply and demand in the market. *Market structure* includes such elements as the number of buyers and sellers interacting in the market; barriers to entry and exit; and the extent of product differentiation observed in the market. *Conduct* refers to business firm behavior observed in the market, such as pricing strategy and the nature of investment decisions. *Performance* refers to how well the market appears to work relative to such criteria as static and dynamic economic efficiency. The basic hypothesis of the S/C/P paradigm is that observed market performance depends on the extent of competition that is determined by and measured in terms of the specific components of market structure and conduct.[6]

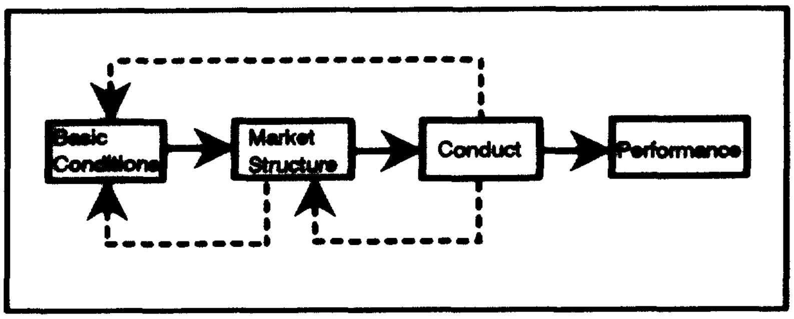

Figure 2—The Structure-Conduct-Performance Paradigm

The S/C/P paradigm is clearly a useful framework for studying the extent of competition in a given industry.[7] Nevertheless, this analytical methodology is subject to important limitations. One inherent difficulty with the paradigm is the tendency to view the extent of competition largely in *structuralist* terms, emphasizing the number of buyers and sellers actually observed in the market. The recent theory of *contestable markets* addresses this aspect of the S/C/P paradigm by emphasizing that the nature and extent of entry barriers, not the number of competitors, is the critical element of market structure that affects market performance.[8] Contestable market theory asserts certain conditions where the conduct of a monopoly firm facing no actual competitors may in theory achieve good market performance.[9] Economists writing

[6] Appendix A provides a brief discussion of the S/C/P paradigm, including definitions of the key concepts of static and dynamic economic efficiency, for readers unfamiliar with industrial organization methodology.

[7] The S/C/P paradigm may also be recast as a framework for formulating business and competitive strategy as taught in graduate schools of business. See, for example, Michael E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (New York: The Free Press, 1980).

[8] See William J. Baumol, John C. Panzar, and Robert D. Willig, *Contestable Markets and The Theory of Industry Structure* (New York: Harcourt Brace Jovanovich, 1982).

from a contemporary Austrian economics perspective criticize the S/C/P paradigm for placing too little emphasis on the role of entrepreneurship and how it affects market performance. Additionally, modern Austrian economists stress that competition should be viewed more as a *process* operating in an environment of uncertainty rather than as a structure that tends to be rigid or static through time.[10]

For the purposes of this paper, the most important limitation of the S/C/P paradigm for assessing the extent of competition, especially in U.S. domestic telecommunications markets, is its lack of sufficient emphasis on the peculiarities and policy implications of specific types of market *transactions*. The conceptual basis for the study of discrete market transactions is developed in the following section.

2.2 *Analyzing the Foundations of Market Transactions: Implications for the Development of Competition in Local Telecommunications Markets*

The conceptual basis of the FCC's policies favoring and encouraging competition in U.S. domestic telecommunications markets over the years has often been formed in broad terms consistent with the linkage of structure, conduct, and market performance established by the S/C/P paradigm. The actual *implementation* of the Commission's pro-competition policies often occurs at a far more detailed or fine-grained level of analysis. In many cases, the implementation of the FCC's pro-competitive policies has required the Commission to regulate with considerable specificity the nature of the transactions between a customer and telecommunications common carriers, including LECs, that are subject to the FCC's regulatory authority. Although such detailed regulatory intervention between supplier and customer is often described as "tariff review," the scope of such regulatory activity goes much deeper than the price of the service offered and commonplace terms and conditions of the tariffed service. Although it may be viewed as paradoxical, such detailed

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[9] Contestable market theory is itself subject to critical limitations and qualifications as a methodology for predicting market performance. See, for example, the discussion provided by William G. Shepherd, "Concepts of Competition and Efficient Policy in the Telecommunications Sector" in *Telecommunications Regulation Today and Tomorrow*, ed. Eli M. Noam (New York: Harcourt Brace Jovanovich, 1983), pp. 79-120. Given the prevalence of asset specificity problems as explained later in the text that will likely characterize the development of competition in local telecommunications markets for many years to come, contestable market theory provides an inappropriate model for forecasting performance in such markets.

[10] A brief discussion that provides the flavor of Austrian criticisms of the S/C/P paradigm is provided by W. Duncan Reekie, *Industry, Prices and Markets* (New York: John Wiley & Sons, 1979), Chapter 6.

regulation of the transaction has often had a major influence on the development of competition in U.S. domestic telecommunications markets.[11]

Recent economic research in the emerging literature on the *New Institutional Economics* (NIE) takes the transaction, i.e., the act of voluntary exchange between one or more parties, as the basic unit of economic analysis.[12] Careful attention to the peculiarities of a specific transaction, or class of transactions, motivates the search for institutions that minimize the cost of completing the transaction between buyer and seller. The analysis of institutions that minimize transaction cost identifies specific factual circumstances where voluntary market exchange may be difficult or impossible. Such circumstances, if unrecognized, may frustrate the full implementation of public policies intended to promote voluntary exchange within competitive markets.

The following discussion analyzes certain aspects of the development of competition in markets for local telecommunications services from the viewpoint of transaction cost economics. Section 2.2.1 examines the critical role of the definition of *property rights* in the development of competition in telecommunications markets. Section 2.2.2 establishes the key concepts essential for analyzing transactions to discover the type of regulatory intervention that may be essential to overcome *transactional barriers* that may impede the development of competitive local telecommunications markets.[13]

2.2.1 Establishment of Property Rights and the Emergence of Telecommunications Competition

An economic transaction between two parties involves the exchange of *property rights* that are inherent in the good or service actually exchanged for money or other commodities: both parties voluntarily surrender their property rights in money or property to gain new property rights that improve their economic well-being relative to their economic positions before the transaction.[14] Such exchange represents the

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[11] CAPs in their relationship with LECs will sometimes be similar to end-users, in a customer-carrier relationship, but at other times, and perhaps at the same time, will not be a customer but will be a co-carrier and entitled to co-carrier status. The term "customer" is used in this paper to represent both possible types of relationships.

[12] A leading contributor to the growing literature on the NIE is Professor Oliver E. Williamson at the University of California at Berkeley. His treatise, *The Economic Institutions of Capitalism* (New York: The Free Press, 1985), provides a comprehensive development of transaction cost economics as a major aspect of the NIE.

[13] Transactional barriers are analogous to *entry barriers* in the S/C/P paradigm. Both types of barriers impede the development of competition.